Assessment of the most sustainable "management scenario" for an old pesticide dumpside

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A novel multi–criteria model was used as a decision-support-tool to select the most "sustainable" management scenario for an old pesticide dumpsite

Background

- **1950s/1960s:** Dumping of chemical waste, mainly pesticides (parathion, malathion, mercury etc.)
- **1970s/1980s:** Part of the contamination was excavated
- **2006:** Encapusulation of the site (14 m deep steel sheet piling)
- **2014:** >100 tons of toxic chemicals remains in the ground
- **2014:** Decision on future management of the dumpsite

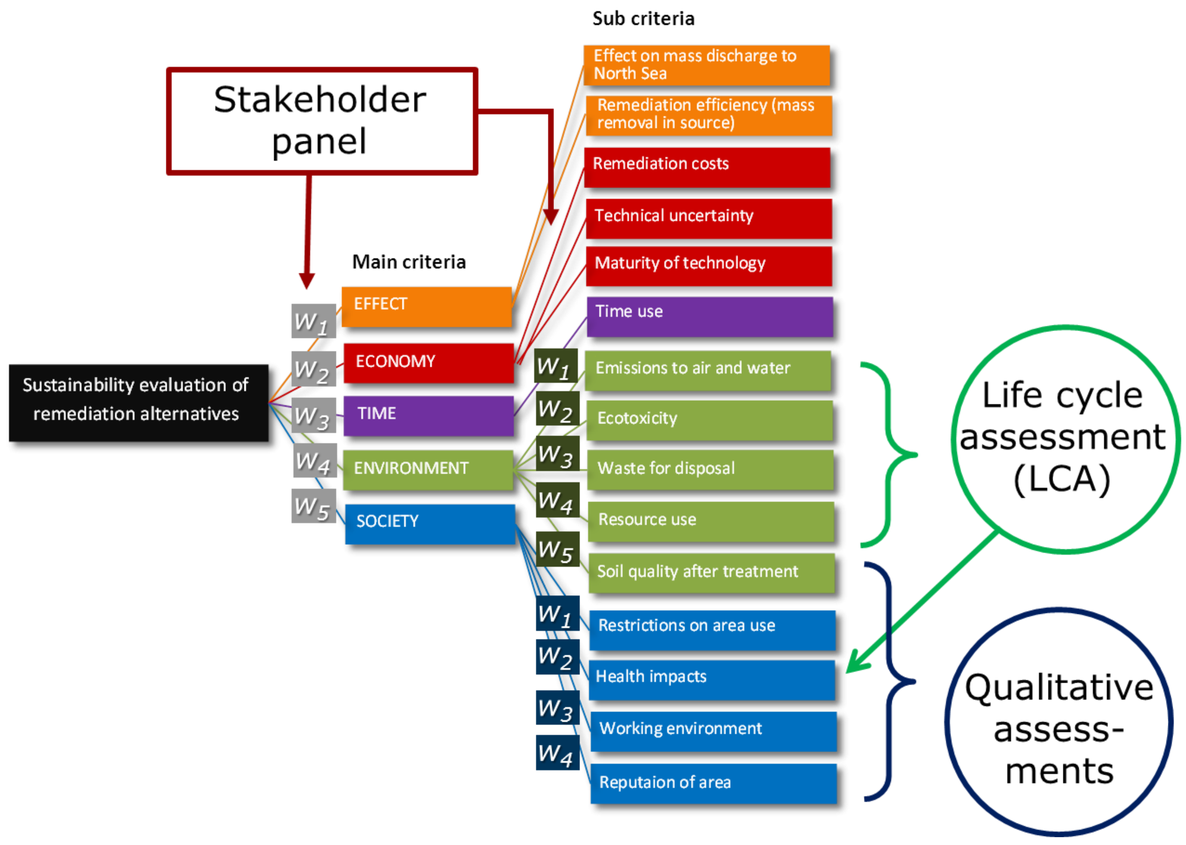
Groyne 42
Pesticide dumpsite

Remediation alternatives ("management scenarios")

Scenario (method)	Price (mio. euro)	Time (years)	Pesticides removed (%)	Mercury Removed (%)
In situ alkaline hydrolysis	13	12	> 90%	10-20
In situ thermal remediation	16	5	> 95%	0
Excavation +off-site treatment	34	6	100%	100
Encapsulation (continued)	0,13 (pr. year)	-	0	0

What scenario is the most sustainable?

A multi-criteria model was used to assess sustainability



Results

When criteria weights derived by the stakeholders are taken into consideration the assessment shows that:

Continued encapsulation is the least sustainable solution

This is primarily due to large societal impacts and the poor effect on contaminant removal

Excavation, off-site treatment and disposal becomes the most sustainable solution

This is due to large removal efficiency for both pesticides and mercury and a low impacts on society.

Stakeholder workshop — decision on criteria weights (W)

Conclusion

In August 2014 the Regional politicians decided on "excavation and off-site treatment" as the future remediation method based on the result of the sustainability assessment using the multi-criteria model and stakeholder involvement.